

Dual N-Channel Enhancement Mode MOSFET

1. Product Information

1.1 Features

- ☒ CSP package
- ☒ Advanced trench cell design
- ☒ Extremely low threshold voltage
- ☒ ESD protected

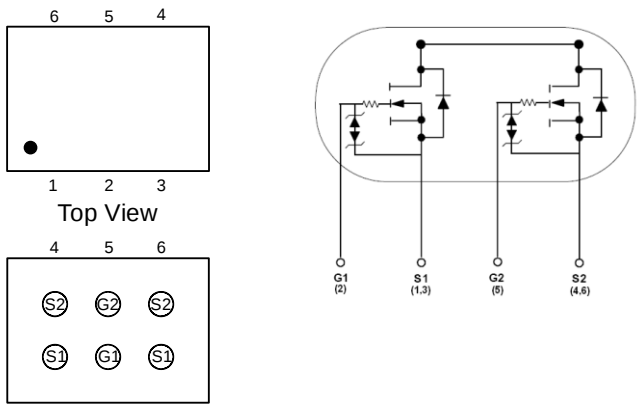
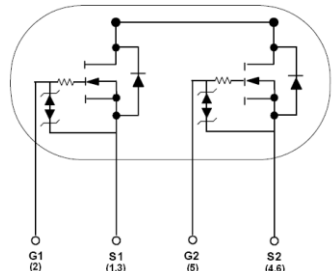
1.2 Applications

- ☒ Portable appliances
- ☒ Battery management

1.3 Quick reference

- ☒ $BV \geq 12\text{ V}$
- ☒ $P_{tot} \leq 3.8\text{ W}$
- ☒ $I_s \leq 20\text{ A}$
- ☒ $R_{DS(ON)} \leq 6.0\text{ m}\Omega @V_{GS} = 4.5\text{ V}$
- ☒ $R_{DS(ON)} \leq 7.0\text{ m}\Omega @V_{GS} = 3.9\text{ V}$
- ☒ $R_{DS(ON)} \leq 8.5\text{ m}\Omega @V_{GS} = 2.5\text{ V}$

2. Pin Description

Pin	Description	Simplified Outline	Symbol
1,3	Source(S1)	 Top View Bottom View CSP 2.46x1.76	
2	Gate(G1)		
4,6	Source(S2)		
5	Gate(G2)		

3. Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
V _{SS}	Source-Source Voltage	T _A =25°C	12	-	V
V _{GS}	Gate-Source Voltage	T _A =25°C	-	±10	V
I _S *	Source Current	T _A =25°C, V _{GS} =4.5 V	-	20	A
I _{SM} *, **	Pulsed Source Current	T _A =25°C, V _{GS} =4.5 V	-	80	A
P _{tot} *	Total Power Dissipation	T _A =25°C	-	3.8	W
		T _A =70°C	-	2.4	
T _J , T _{stg}	Operating Junction and Storage Temperature Range		-55	150	°C
R _{θJA} *	Thermal Resistance-Junction to Ambient		-	32.8	°C/W

Notes:

* Surface mounted on 1 in² pad area, t ≤ 10 sec.

** Pulse width ≤ 10 μs, duty cycle ≤ 1%.

4. Marking Information

Product Name	Marking
KJ604C	604

5. Ordering Code

Product Name	Package	Reel size	Tape width	Quantity (pcs)
KJ604C	CSP 2.46x1.76	7"	8 mm	3000

Note: KUAJIEXIN defines "Green" as lead-free (RoHS compliant) and halogen free (Br or Cl does not exceed 900 ppm by weight in homogeneous material and total of Br and Cl does not exceed 1500 ppm by weight; Follow IEC 61249-2-21 and IPC/JEDEC J-STD-020C).

6. Electrical Characteristics (T_A=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static Characteristics						
BV _{SSS}	Source-Source Breakdown Voltage	V _{GS} =0 V, I _S =250 μA	12	-	-	V
V _{GS(th)}	Gate Threshold Voltage	V _{SS} =10V, I _S =250 μA	0.5	-	1.0	V
I _{SSS}	Zero Gate Voltage Source Current	V _{SS} =10 V, V _{GS} =0 V	-	-	1	μA
		T _J =85°C	-	-	30	μA
I _{GSS}	Gate Leakage Current	V _{GS} =±10 V, V _{DS} =0 V	-	-	± 10	μA
R _{SS(ON)} ^a	Source-source On-State Resistance	V _{GS} =4.5 V, I _S =5 A	-	5	6	mΩ
		V _{GS} =3.9 V, I _S =4 A	-	5.3	7	
		V _{GS} =2.5 V, I _S =3 A	-	6.8	8.5	
Diode Characteristics						
V _{FSS} ^a	Diode Forward Voltage	I _S =5 A, V _{GS} =0 V	-	-	1.3	V
Dynamic Characteristics ^b						
C _{iss}	Input Capacitance	V _{GS} =0 V, V _{SS} =6 V, Frequency=1 MHz	-	3118	-	pF
C _{oss}	Output Capacitance		-	648	-	
C _{rss}	Reverse Transfer Capacitance		-	554	-	
t _{d(on)}	Turn-on Delay Time	V _{SS} =6 V, V _{GEN} =4.5 V, R _G =4.5 Ω, R _L =1.2 Ω, I _S =5 A	-	849	-	ns
t _r	Turn-on Rise Time		-	1798	-	
t _{d(off)}	Turn-off Delay Time		-	1216	-	
t _f	Turn-off Fall Time		-	5710	-	
Gate Charge Characteristics ^b						
Q _g	Total Gate Charge	V _{GS} =4.5 V, V _{SS} =10 V, I _S =5 A	-	54	-	nC
Q _{gs}	Gate-Source Charge		-	5.9	-	
Q _{gd}	Gate-Drain Charge		-	9.7	-	

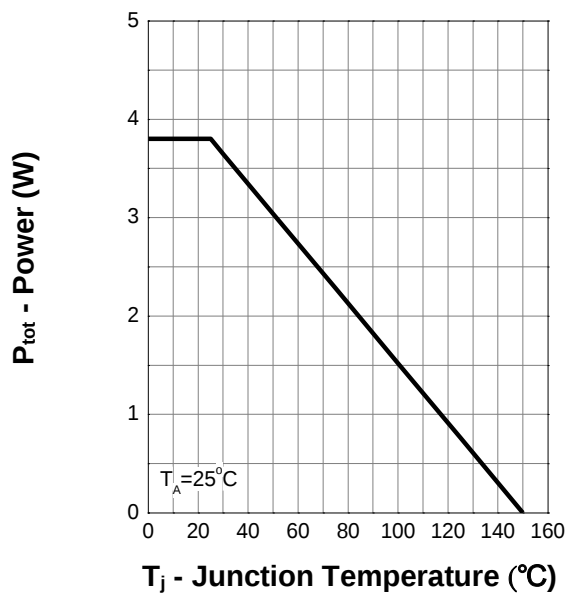
Notes:

a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.

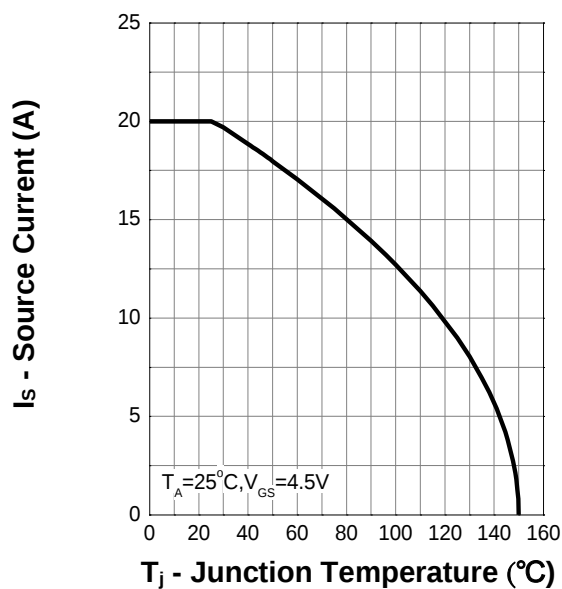
b. Guaranteed by design, not subject to production testing.

7. Typical Characteristics

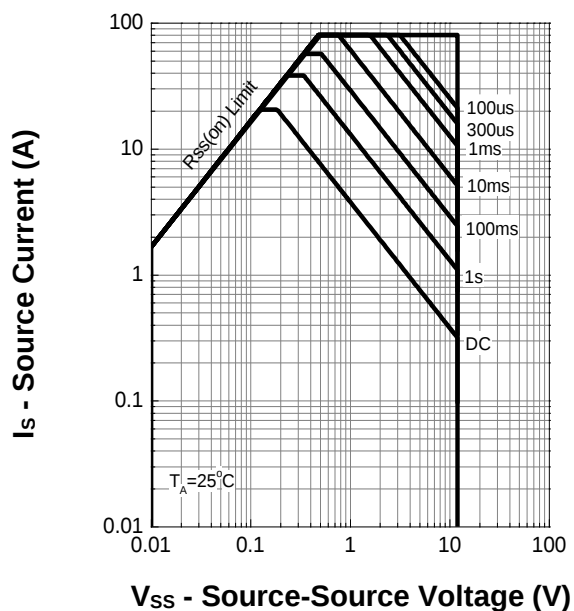
Power Dissipation



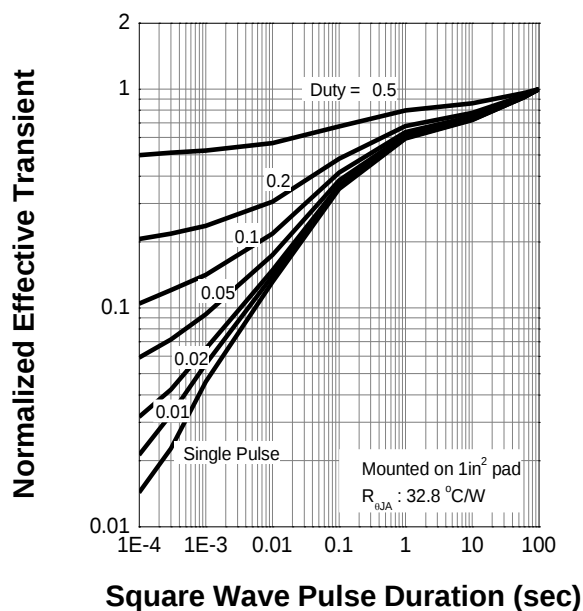
Source Current



Safe Operation Area

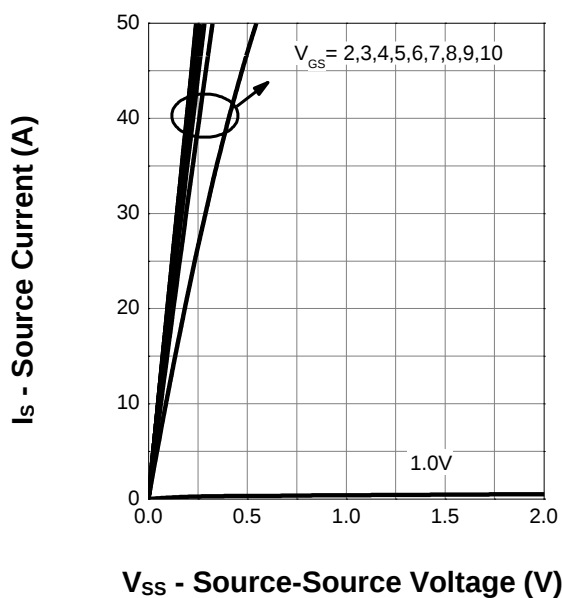


Thermal Transient Impedance

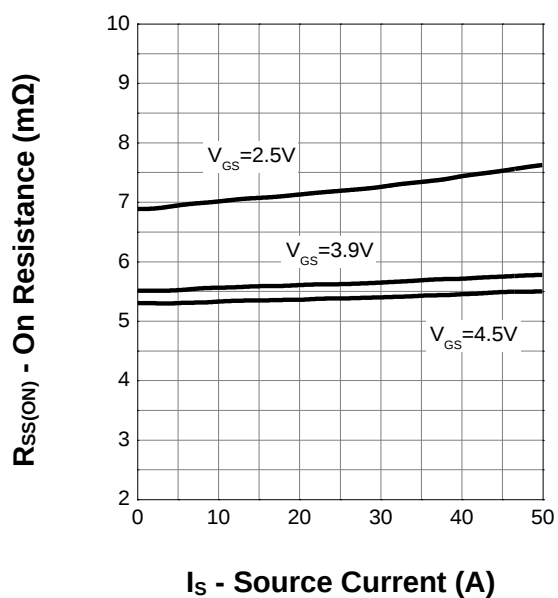


7. Typical Characteristics (cont.)

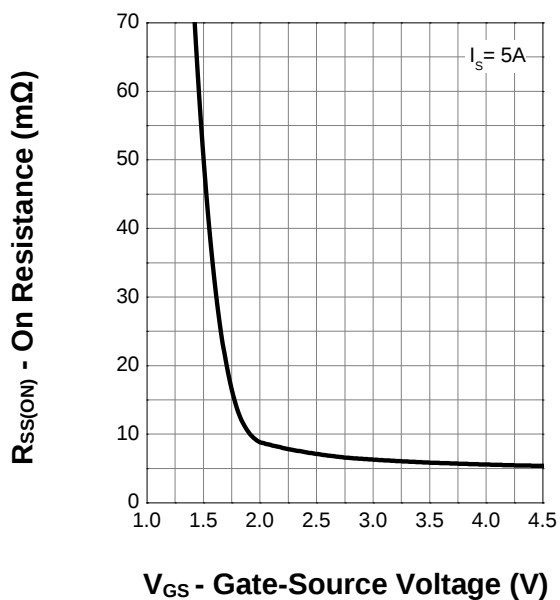
Output Characteristics



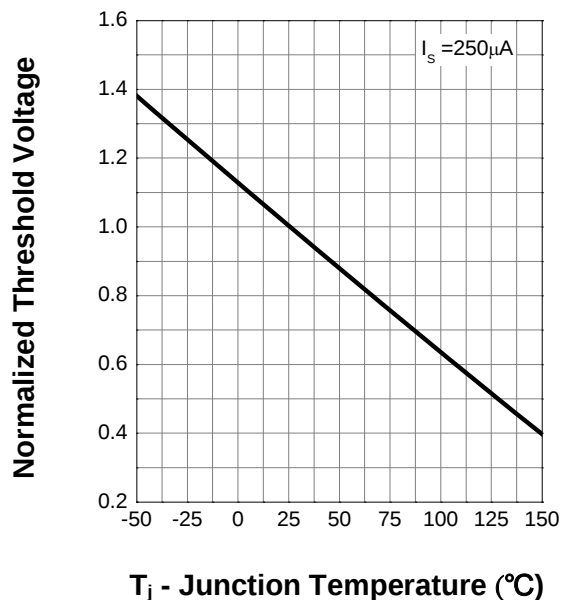
Source-Source On Resistance



Transfer Characteristics

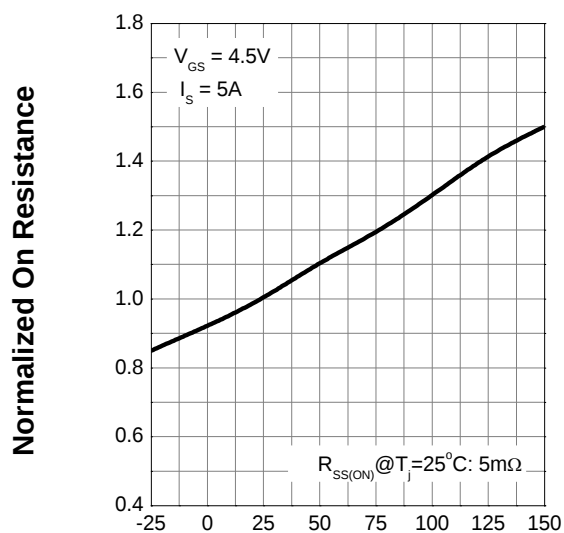


Gate Threshold Voltage



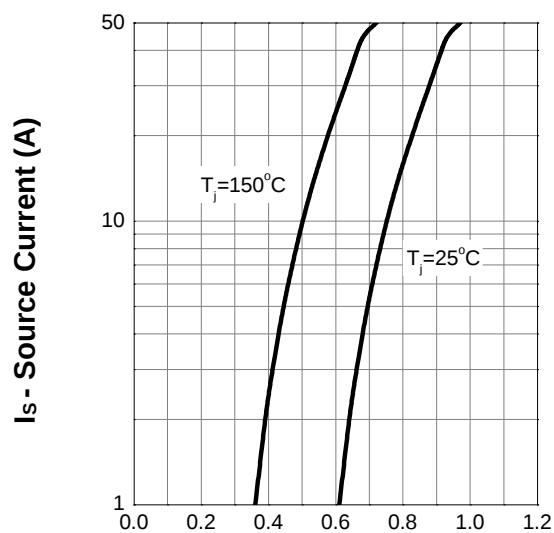
7. Typical Characteristics (cont.)

Source-Source On Resistance



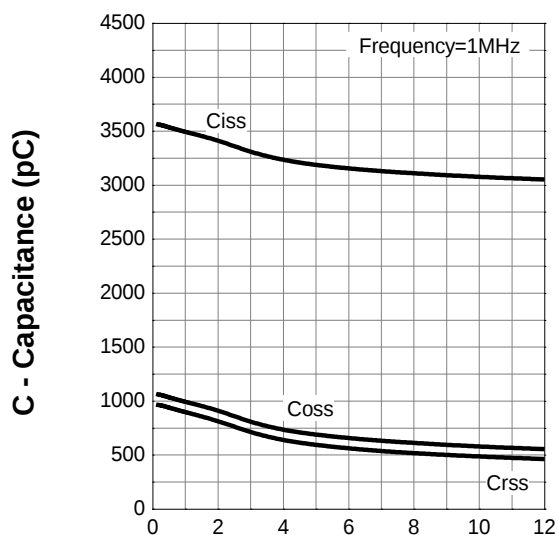
T_j - Junction Temperature ($^{\circ}\text{C}$)

Body Diode Characteristics



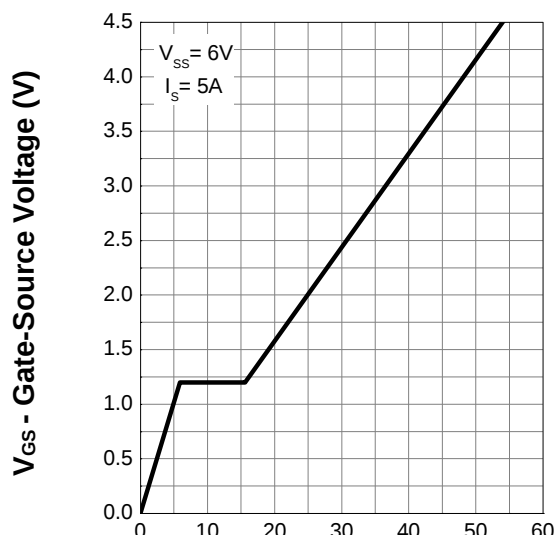
V_{SS} - Source-Source Voltage (V)

Capacitance



V_{SS} - Source-Source Voltage (V)

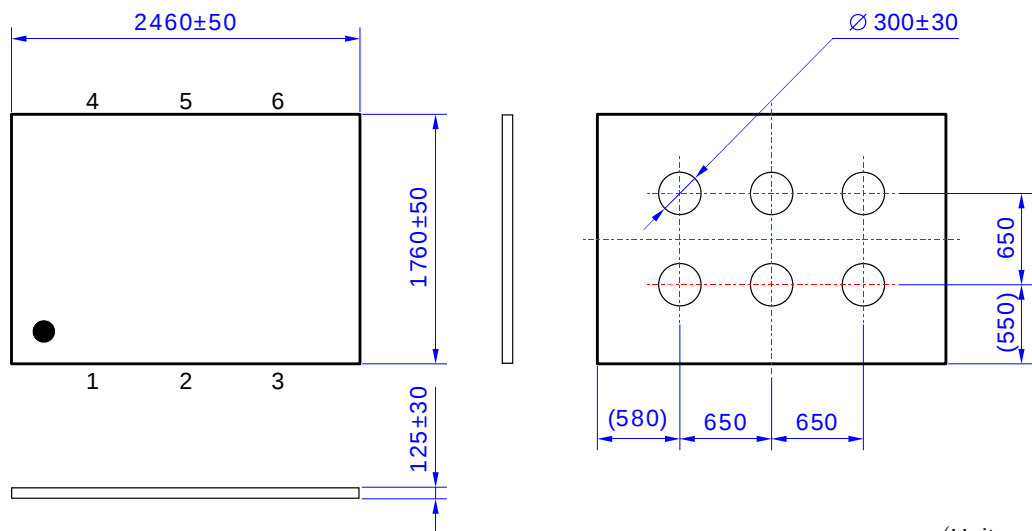
Gate Charge



Q_G - Gate Charge (nC)

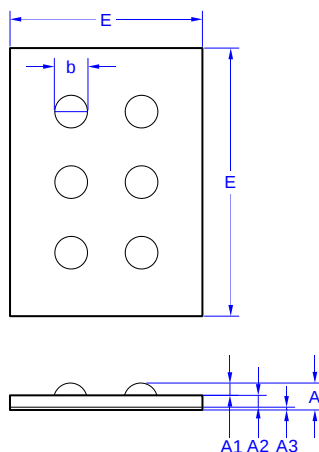
8. Package Dimensions

CSP 2.46x1.76 Package



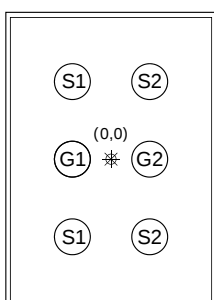
(Unit: um)

● Structure Information



Symbol	Dimension (mm)		
	MIN	NOM	MAX
A	0.145	0.195	0.245
A1	0.035	0.050	0.065
A2	0.095	0.125	0.155
A3	0.010	0.020	0.030
b	0.285	0.300	0.315
E	1.710	1.760	1.810
D	2.410	2.460	2.510
MIN Ball pitch: 0.650			

● Ball Map (View: Chip side Up)



Pin Number	X Coord	Y Coord
S1	-325.00	650.00
S2	325.00	650.00
G1	-325.00	0.00
G2	325.00	0.00
S1	-325.00	-650.00
S2	325.00	-650.00
(Unit: um)		